

Historic, Archive Document

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Interpreting Streamflow Forecasts

Introduction

Each month, five forecasts are issued for each forecast point and each forecast period. Unless otherwise specified, all streamflow forecasts are for streamflow volumes that would occur naturally without any upstream influences. Water users need to know what the different forecasts represent if they are to use the information correctly when making operational decisions. The following is an explanation of each of the forecasts.

Most Probable (50 Percent Chance of Exceeding) Forecast. This forecast is the best estimate of streamflow volume that can be produced given current conditions and based on the outcome of similar past situations. There is a 50 percent chance that the streamflow volume will exceed this forecast value. There is a 50 percent chance that the streamflow volume will be less than this forecast value.

The most probable forecast will rarely be exactly right, due to errors resulting from future weather conditions and the forecast equation itself. This does not mean that users should not use the most probable forecast; it means that they need to evaluate existing circumstances and determine the amount of risk they are willing to take by accepting this forecast value.

To Decrease the Chance of Having Too Little Water

If users want to make sure there is enough water available for their operations, they might determine that a 50 percent chance of the streamflow volume being lower than the most probable forecast is too much risk to take. To reduce the risk of not having enough water available during the forecast period, users can base their operational decisions on one of the forecasts with a greater chance of being exceeded (or possibly some point in-between). These include:

70 Percent Chance of Exceeding Forecast. There is a 70 percent chance that the streamflow volume will exceed this forecast value. There is a 30 percent chance the streamflow volume will be less than this forecast value.

90 Percent Chance of Exceeding Forecast. There is a 90 percent chance that the streamflow volume will exceed this forecast value. There is a 10 percent chance the streamflow volume will be less than this forecast value.

To Decrease the Chance of Having Too Much Water

If users want to make sure they don't have too much water, they might determine that a 50 percent chance of the streamflow being higher than the most probable forecast is too much of a risk to take. To reduce the risk of having too much water available during the forecast period, users can base their operational decisions on one of the forecasts with a smaller chance of being exceeded. These include:

30 Percent Chance of Exceeding Forecast. There is a 30 percent chance that the streamflow volume will exceed this forecast value. There is a 70 percent chance the streamflow volume will be less than this forecast value.

10 Percent Chance of Exceeding Forecast. There is a 10 percent chance that the streamflow volume will exceed this forecast value. There is a 90 percent chance the streamflow volume will be less than this forecast value.

Using the forecasts—an example

Using the Most Probable Forecast. Using the example forecasts shown below, users can reasonably expect 36,000 acre-feet to flow past the gaging station on the Mary's River near Deeth between March 1 and July 31.

Using the Higher Exceedance Forecasts. If users anticipate a somewhat drier trend in the future (monthly and seasonal weather outlooks are available from the National Weather Service every two weeks), or if they are operating at a level where an unexpected shortage of water could cause problems, they might want to plan on receiving only 20,000 acre-feet (from the 70 percent chance of exceeding forecast). In seven out of ten years with similar conditions, streamflow volumes will exceed the 20,000 acre-foot forecast.

If users anticipate extremely dry conditions for the remainder of the season, or if they determine the risk of using the 70 percent chance of exceeding forecast is too great, then they might plan on receiving only 5000 acre-feet (from the 90 percent chance of exceeding forecast). Nine out of ten years with similar conditions, streamflow volumes will exceed the 5000 acre-foot forecast.

Using the Lower Exceedance Forecasts. If users expect wetter future conditions, or if the chance that five out of every ten years with similar conditions would produce streamflow volumes greater than 36,000 acre-feet was more than they would like to risk, they might plan on receiving 52,000 acre-feet (from the 30 percent chance of exceeding forecast) to minimize potential flooding problems. Three out of ten years with similar conditions, streamflows will exceed the 52,000 acre-foot forecast.

In years when users expect extremely wet conditions for the remainder of the season and the threat of severe flooding and downstream damage exists, they might choose to use the 76,000 acre-foot (10 percent chance of exceeding) forecast for their water management operations. Streamflow volumes will exceed this level only one year out of ten.

| UPPER HUMBOLDT RIVER BASIN | | | | | | | | | | | | | |
|----------------------------------|-----------------|--|------|----------|----|---------------------|--|----------|-----|----------|--|----------|--|
| STREAMFLOW FORECASTS | | | | | | | | | | | | | |
| FORECAST POINT | FORECAST PERIOD | <-----DRIER----- FUTURE CONDITIONS -----WETTER-----> | | | | | | | | | | | |
| | | ----- Chance of Exceeding ----- | | | | | | | | | | | |
| | | 90% | | 70% | | 50% (Most Probable) | | 30% | | 10% | | 25 YR. | |
| | | (1000AF) | | (1000AF) | | (1000AF) (% AVG.) | | (1000AF) | | (1000AF) | | (1000AF) | |
| MARY'S RIVER nr Deeth | MAR-JUL | 5.0 | 20.0 | | 36 | 77 | | 52 | 76 | 47 | | | |
| | APR-JUL | 8.0 | 17.0 | | 31 | 74 | | 45 | 67 | 42 | | | |
| LAMOILLE CREEK nr Lamoille | MAR-JUL | 6.0 | 16.0 | | 24 | 79 | | 32 | 43 | 31 | | | |
| | APR-JUL | 4.0 | 15.0 | | 22 | 75 | | 30 | 41 | 30 | | | |
| NF HUMBOLDT RIVER at Devils Gate | MAR-JUL | 6.0 | 12.0 | | 43 | 73 | | 74 | 121 | 59 | | | |

For more information concerning streamflow forecasting ask your local SCS field office for a copy of "A Field Office Guide for Interpreting Steamflow Forecasts".

GENERAL OUTLOOK

- IDAHO -

SUMMARY

APRIL 1, 1991

HEAVY PRECIPITATION DURING EARLY MARCH HAS IMPROVED SNOWPACKS CONSIDERABLY IN CENTRAL AND SOUTHERN IDAHO, BUT THE WATER SUPPLY OUTLOOK STILL REMAINS CRITICALLY LOW FOR MANY BASINS. STREAMFLOW FORECASTS CALL FOR NEAR AVERAGE CONDITIONS IN NORTHERN IDAHO, 28 TO 64 PERCENT OF AVERAGE IN CENTRAL IDAHO, AND 65 TO 86 PERCENT OF AVERAGE IN THE UPPER SNAKE BASIN IN EASTERN IDAHO AND WESTERN WYOMING. THESE LOW FORECASTS, COUPLED WITH VERY LOW RESERVOIR STORAGE, INDICATE THE POTENTIAL FOR CRITICAL IRRIGATION WATER SHORTAGES IN CENTRAL AND SOUTHERN IDAHO. ALL WATER USERS SHOULD KEEP IN TOUCH WITH THEIR LOCAL IRRIGATION DISTRICTS FOR MORE SPECIFIC INFORMATION.

SNOWPACK

Heavy snowfall during the first half of March improved snowpack conditions considerably in many drainage basins in central and southern Idaho. The Big Wood River basin essentially doubled its snowpack during the first four days of March. However, conditions still remain well below normal in most basins in the southern half of the state. Snowpacks currently range from 80 to 95% of normal in northern Idaho, 50 to 70% in the central part of the state, 60 to 70% along the southern edge of the state, and 70 to 80% in eastern Idaho and the upper Snake basin in western Wyoming. April 1 is typically the peak of snowpack accumulation, and the melt season could begin any time. The timing of snowmelt, coupled with spring precipitation, will determine the effectiveness of Idaho's snowpack in producing runoff.

PRECIPITATION

Most of the state received above normal precipitation during March, with the heaviest amounts falling in the central mountains where it was needed the most. SNOTEL stations in the Wood and Lost River basins reported almost twice the normal precipitation for the month. Amounts were closer to average in northern Idaho and along the southern edge of the state. Most of the mountain precipitation fell in the form of snow, improving snowpack conditions considerably. Temperatures around the state were slightly above normal, with Boise reporting a 1.6 degree departure from normal and Pocatello reporting 3 degrees above normal. The National Weather Service's 30 day outlook for April calls for near normal precipitation and near normal temperatures for the entire state.

RESERVOIRS

Most reservoir levels across the state improved only slightly during the month of March. Currently, reservoir levels are near average in the Snake River, above average in Dworshak and in the Payette basin, and below to well below average in northern, central and southern Idaho. The lowest levels include Magic (23% of average, 14% of capacity), Salmon Falls (36% of average, 12% of capacity) and Oakley (39% of average, 17% of capacity). Reservoirs on the mainstem of the Snake River are not expected to fill totally, but an adequate irrigation supply is expected. Irrigators who rely on stored irrigation water should keep in touch with their local reservoir operators and irrigation districts for more specific information.

STREAMFLOW

March streamflow was near normal in the upper Snake River, slightly below normal in the Clearwater and Henrys Fork, and well below normal throughout central and southern Idaho. Above normal snow accumulation in March has resulted in an increase in most runoff projections since last month. Forecasts for the coming runoff season vary widely around the state, reflecting the diverse snowpack situation. Central and southern Idaho forecasts are in the well below normal category, ranging from 28% of average for the Big Wood River to 62% for the Salmon River. Forecasts for eastern Idaho are below average, ranging from 56% of normal for the Bear River to 76% on the Teton River. Northern Idaho streams are forecast to produce near normal seasonal volumes, ranging from 95% of average for the St. Joe to 110% for the Priest. The Clearwater River at Spalding is forecast to produce 79% of average. Water users in basins with below normal forecasts should keep in touch with their local irrigation districts for more specific information concerning their water supply.

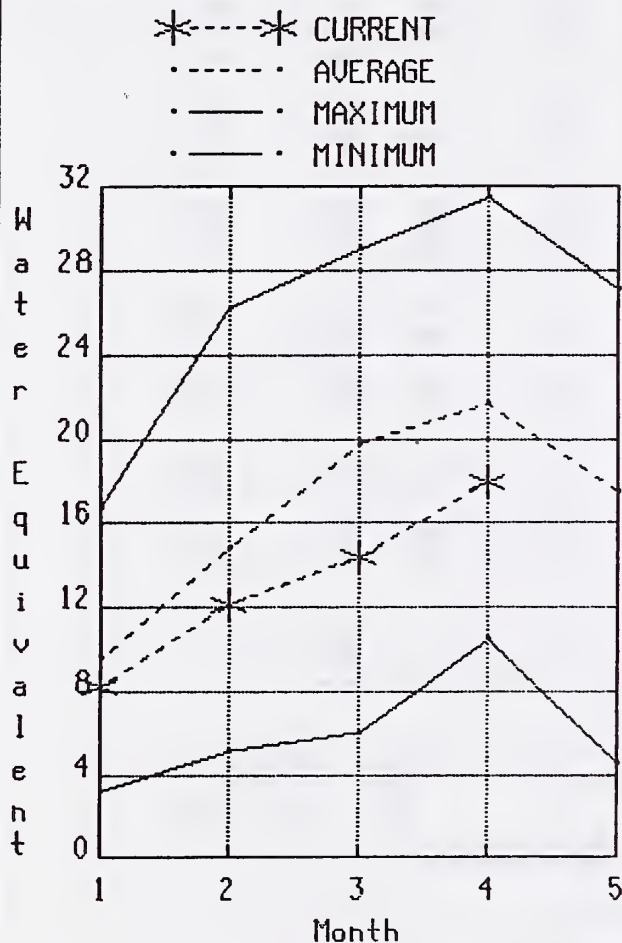
RECREATIONAL OUTLOOK

Heavy snowfall during March has improved the outlook for whitewater boating in the coming spring and summer. Runoff conditions should be near to slightly below average in the northern half of the state for the Selway, Lochsa, St. Joe, and Moyie Rivers. Southern Idaho snowpacks are still below normal, and boaters should expect earlier and lower than normal peak flows and an early return to low flow conditions. On the positive side, rivers will be accessible earlier than normal, with a shorter period of potentially hazardous high flows, and the water will be clearer for fishing and warmer for swimming. Due to above average reservoir storage, the Payette River system will have an excellent boating season. The southwestern desert rivers (Owyhee, Jarbidge, and Bruneau) will have a short season with low flow conditions.

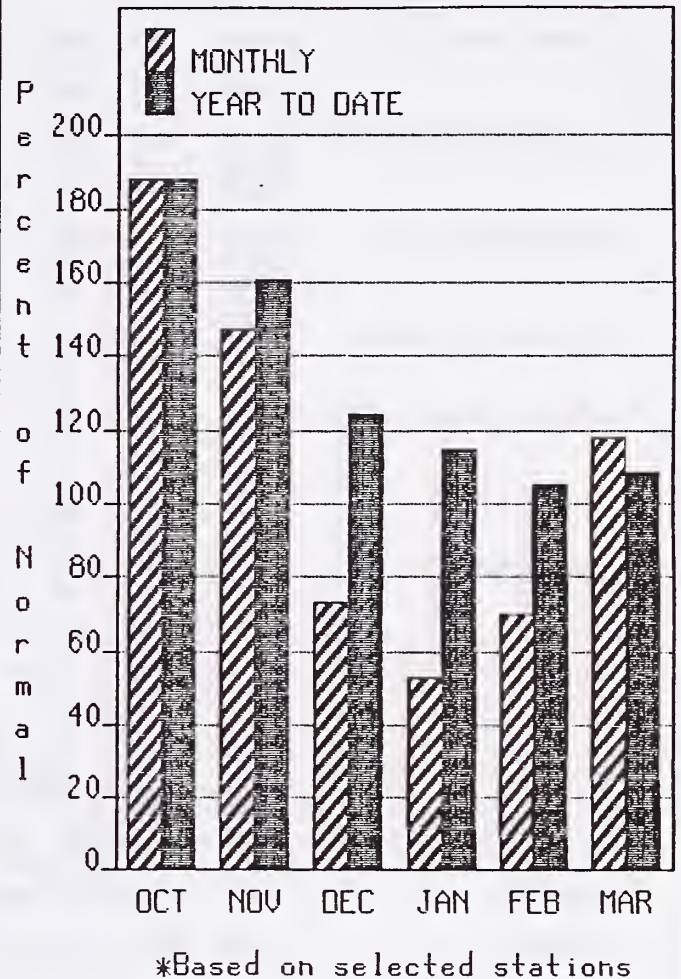
Upper Columbia River Basin

April 1, 1991

Mountain snowpack* (inches)
UPPER COLUMBIA RIVER BASIN



Precipitation* (percent of normal)
UPPER COLUMBIA RIVER BASIN



WATER SUPPLY OUTLOOK

The Idaho Panhandle received slightly above normal snowfall during the month of March, and snowpacks now range from 85% of average in the Clark Fork basin to 108% in the Kootenai basin. Reservoirs report below normal storages for April 1, ranging from 70% of average in Pend Oreille Lake to 78% in Coeur d'Alene and Priest Lakes. Streamflow forecasts call for near normal runoff this spring and summer. All indications point to an adequate water supply for most users in the upper Columbia River basin this spring and summer.

UPPER COLUMBIA RIVER BASIN

| STREAMFLOW FORECASTS | | | | | | | | |
|----------------------------------|-----------------|--|-----------------|---------------------------------|----------|-----------------|--------------------|-------|
| FORECAST POINT | FORECAST PERIOD | <----- DRIER ----- FUTURE CONDITIONS ----- WETTER -----> | | | | | | |
| | | CHANCE OF EXCEEDING * | | | | | 25 YR. (1000AF) | |
| | | 90% (1000AF) | 70% (1000AF) | 50% (MOST PROBABLE) (1000AF) | (% AVG.) | 30% (1000AF) | 10% (1000AF) | |
| KOOTENAI at Leonia (1,2) | APR-SEP | 9220 | 10300 | 10800 | 128 | 11300 | 12400 | 8441 |
| | APR-JUL | 8020 | 8960 | 9390 | 128 | 9820 | 10800 | 7340 |
| | APR-JUN | 6450 | 7210 | 7550 | 128 | 7900 | 8650 | 5899 |
| CLARK FK at Whitehorse Rpd (1,2) | APR-SEP | 11100 | 13000 | 13800 | 103 | 14600 | 16500 | 13370 |
| | APR-JUL | 10100 | 11700 | 12500 | 103 | 13300 | 14900 | 12150 |
| | APR-JUN | 8640 | 10100 | 10700 | 103 | 11300 | 12800 | 10360 |
| PEND OREILLE LAKE inflow (1,2) | APR-SEP | 13000 | 15000 | 15900 | 106 | 16800 | 18800 | 14930 |
| | APR-JUL | 11900 | 13700 | 14500 | 106 | 15300 | 17200 | 13650 |
| | APR-JUN | 10200 | 11700 | 12500 | 106 | 13300 | 14800 | 11780 |
| PRIEST nr Priest-River (1,2) | APR-SEP | 765 | 915 | 985 | 110 | 1050 | 1200 | 893 |
| | APR-JUL | 720 | 860 | 925 | 110 | 990 | 1120 | 838 |
| COEUR D'ALENE at Enaville (1) | APR-SEP | 595 | 765 | 840 | 101 | 915 | 1090 | 830 |
| | APR-JUL | 565 | 725 | 800 | 101 | 875 | 1030 | 789 |
| ST. JOE at Calder | APR-SEP | 965 | 1120 | 1220 | 95 | 1320 | 1490 | 1281 |
| | APR-JUL | 910 | 1050 | 1150 | 95 | 1250 | 1400 | 1211 |
| SPOKANE nr Post Falls (1,2) | APR-SEP | 1840 | 2440 | 2710 | 96 | 2980 | 3550 | 2820 |
| | APR-JUL | 1770 | 2350 | 2610 | 96 | 2870 | 3450 | 2723 |

| RESERVOIR STORAGE (1000AF) | | | | | WATERSHED SNOWPACK ANALYSIS | | | |
|----------------------------|------------------|-----------------------|-----------|--------|-----------------------------|-------------------|-------------------|---------|
| RESERVOIR | USEABLE CAPACITY | ** USEABLE STORAGE ** | | | WATERSHED | NO. COURSES AVG'D | THIS YEAR AS % OF | |
| | | THIS YEAR | LAST YEAR | AVG. | | | LAST YR. | AVERAGE |
| HUNGRY HORSE | 3451.0 | 1714.0 | 2168.0 | 2098.0 | Kootenai ab Bonners Ferry | 53 | 114 | 117 |
| FLATHEAD LAKE | 1791.0 | 858.2 | 802.9 | 753.0 | Moyie River | 3 | 137 | 136 |
| PEND OREILLE | 1561.2 | 572.6 | 605.8 | 813.7 | Pend Oreille River | 136 | 107 | 98 |
| NOXON RAPIDS | 335.0 | 331.7 | 318.9 | 213.6 | Clark Fork River | 99 | 100 | 87 |
| COEUR D'ALENE | 291.2 | 182.2 | 212.8 | 234.3 | Priest River | 5 | 107 | 96 |
| PRIEST LAKE | 97.7 | 31.0 | 71.6 | 39.8 | Rathdrum Creek | 2 | 59 | 63 |
| | | | | | Hayden Lake | 3 | 61 | 72 |
| | | | | | Coeur d'Alene River | 10 | 92 | 87 |
| | | | | | St. Joe River | 10 | 107 | 97 |
| | | | | | Spokane River | 23 | 98 | 92 |
| | | | | | Palouse River | 1 | 94 | 92 |

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

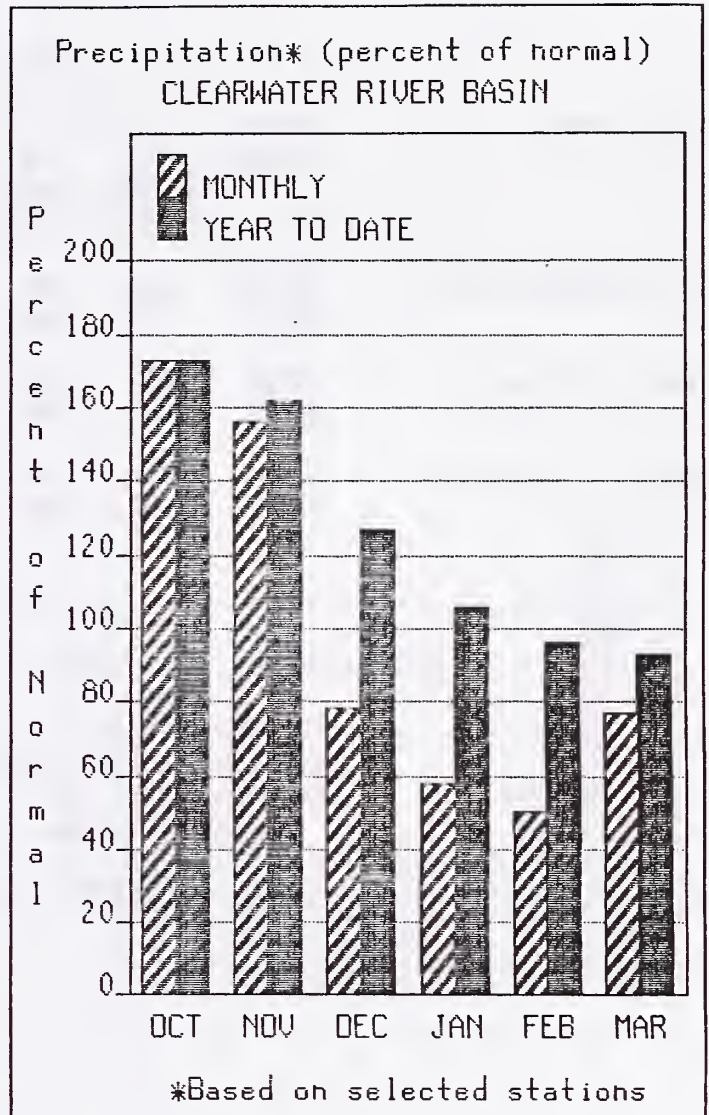
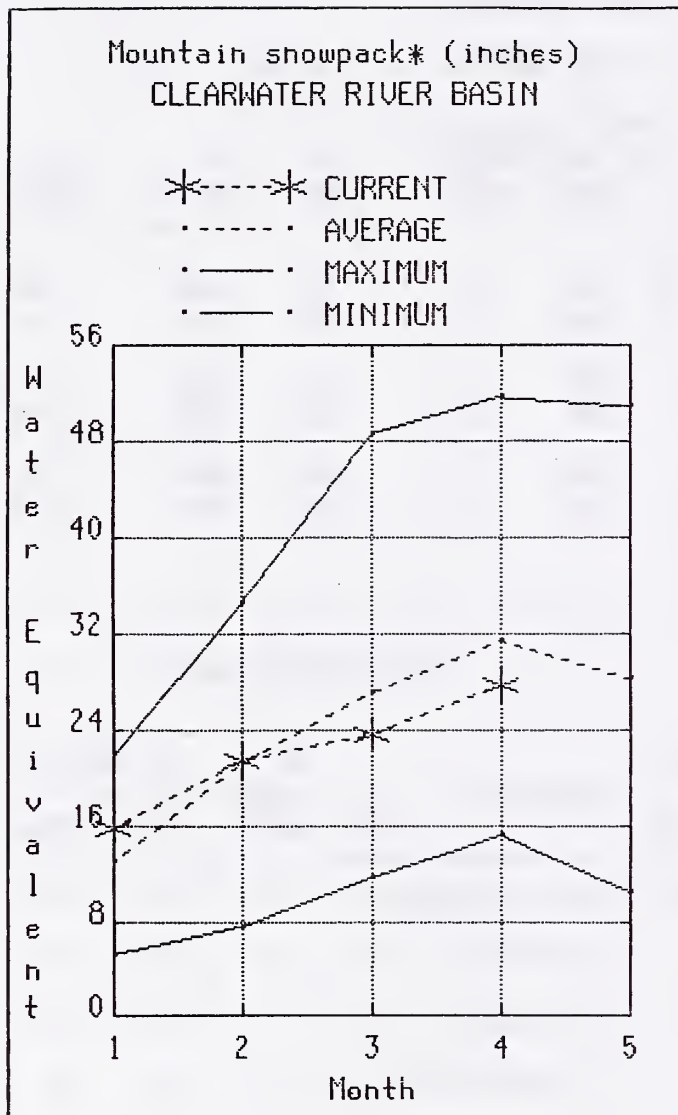
The average is computed for the 1961-1985 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

(2) - The value is natural flow - actual flow may be affected by upstream water management.

Clearwater River Basin

April 1, 1991



WATER SUPPLY OUTLOOK

The Clearwater River basin received near normal snowfall during the month of March. Snowpacks are now near to slightly below normal, ranging from 82% of average in the Lochsa basin to 94% in the North Fork Clearwater. Storage in Dworshak Reservoir is above normal, with 129% of average storage. Streamflow prospects for the coming spring and summer call for slightly below normal runoff, ranging from 79% of average for the Clearwater at Spalding to 83% for the inflow to Dworshak Reservoir. Water supplies should be adequate for most users this year in the Clearwater River basin.

CLEARWATER RIVER BASIN

STREAMFLOW FORECASTS

| FORECAST POINT | FORECAST PERIOD | <div style="display: flex; justify-content: space-between; align-items: center;"> <----- DRIER ----- FUTURE CONDITIONS ----- WETTER -----> </div> | | | | | | |
|-------------------------------|-----------------|--|-----------------|---------------------------------|----------|-----------------|-----------------|--------------------|
| | | CHANCE OF EXCEEDING * | | | | | | 25 YR. (1000AF) |
| | | 90% (1000AF) | 70% (1000AF) | 50% (MOST PROBABLE) (1000AF) | (% AVG.) | 30% (1000AF) | 10% (1000AF) | |
| DWORSHAK RESERVOIR inflow (1) | APR-SEP | 1840 | 2290 | 2500 | 83 | 2710 | 3160 | 3010 |
| | APR-JUL | 1720 | 2150 | 2340 | 83 | 2530 | 2960 | 2822 |
| CLEARWATER at Orofino (1) | APR-SEP | 2750 | 3670 | 4090 | 79 | 4510 | 5430 | 5163 |
| | APR-JUL | 2600 | 3470 | 3870 | 79 | 4270 | 5140 | 4889 |
| CLEARWATER at Spalding (1,2) | APR-SEP | 4710 | 6000 | 6590 | 79 | 7180 | 8470 | 8378 |
| | APR-JUL | 4430 | 5650 | 6210 | 78 | 6770 | 7990 | 7916 |

| RESERVOIR STORAGE (1000AF) | | | | | WATERSHED SNOWPACK ANALYSIS | | | |
|----------------------------|------------------------|-----------------------|--------------|--------|-----------------------------|-------------------------|-------------------|---------|
| RESERVOIR | USEABLE : CAPACITY: | ** USEABLE STORAGE ** | | | WATERSHED | NO. COURSES AVG'D | THIS YEAR AS % OF | |
| | | THIS YEAR | LAST YEAR | AVG. | | | LAST YR. | AVERAGE |
| DWORSHAK | 3467.8 | 2568.0 | 2400.8 | 1996.2 | North Fork Clearwater | 13 | 107 | 94 |
| | | | | | Lochsa River | 5 | 100 | 81 |
| | | | | | Selway River | 7 | 103 | 83 |
| | | | | | Clearwater River | 22 | 105 | 89 |

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

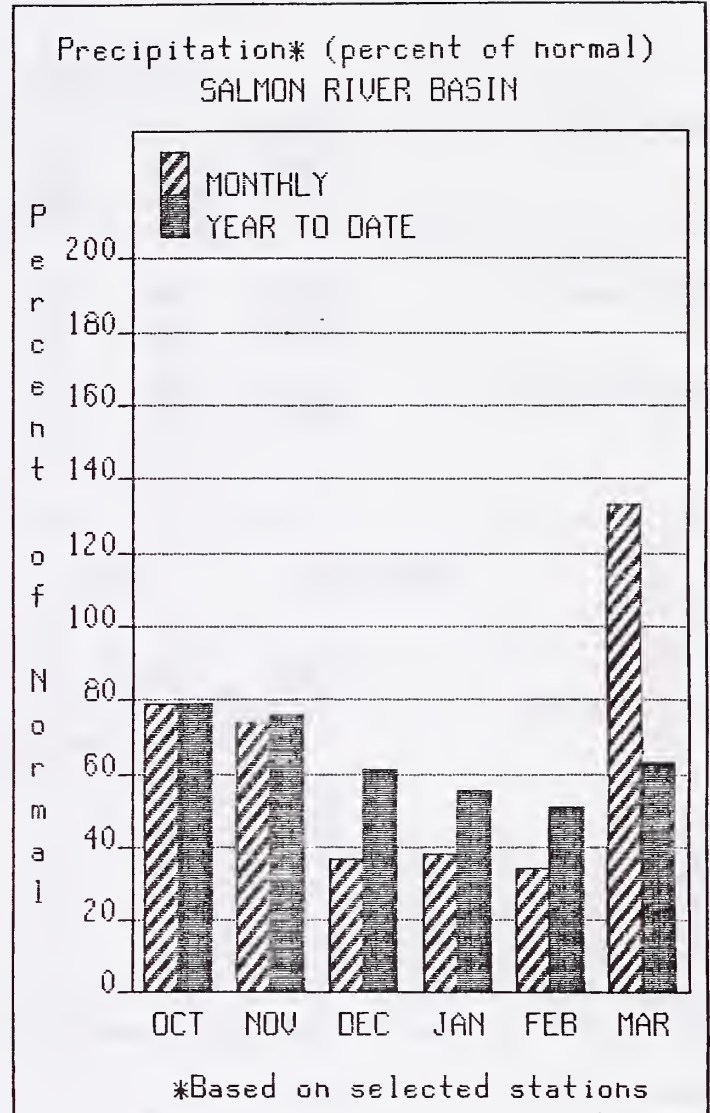
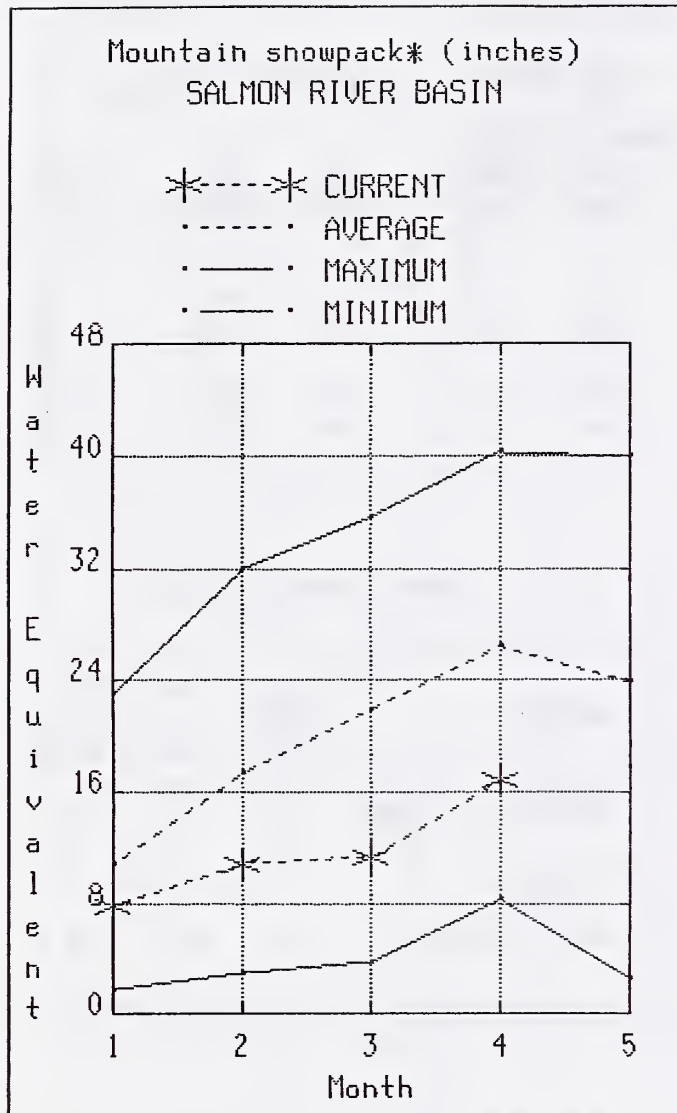
The average is computed for the 1961-1985 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

(2) - The value is natural flow - actual flow may be affected by upstream water management.

Salmon River Basin

April 1, 1991



WATER SUPPLY OUTLOOK

Above normal snowfall in the Salmon River basin has improved snowpacks significantly from the figures reported last month. Currently, snowpacks range from 63% of average in the Salmon basin above Salmon to 80% of average in the Lemhi. Streamflow forecasts have improved slightly as a result, and currently range from 58% for the Salmon at Salmon to 62% for the Salmon at Whitebird. In spite of this improvement, water users should be prepared for lower than normal peak flows and an earlier than normal return to low flow conditions this summer.

SALMON RIVER BASIN

STREAMFLOW FORECASTS

| FORECAST POINT | FORECAST PERIOD | <div> <div><----- DRIER -----</div> <div>FUTURE CONDITIONS</div> <div>----- WETTER -----></div> </div> | | | | | | |
|--------------------------|-----------------|--|----------|---------------------|----|----------|----------|----------|
| | | CHANCE OF EXCEEDING * | | | | | | |
| | | 90% | 70% | 50% (MOST PROBABLE) | | 30% | 10% | 25 YR. |
| | | (1000AF) | (1000AF) | (1000AF) (% AVG.) | | (1000AF) | (1000AF) | (1000AF) |
| SALMON at Salmon (1) | APR-SEP | 260 | 510 | 625 | 58 | 740 | 980 | 1077 |
| | APR-JUL | 220 | 435 | 530 | 58 | 625 | 840 | 919 |
| SALMON at White Bird (1) | APR-SEP | 2780 | 3840 | 4320 | 62 | 4800 | 5860 | 7007 |
| | APR-JUL | 2510 | 3470 | 3900 | 62 | 4330 | 5290 | 6322 |

| RESERVOIR STORAGE (1000AF) | | | | | WATERSHED SNOWPACK ANALYSIS | | | |
|----------------------------|-----------|-----------------------|-----------|------|-----------------------------|-------------------|-------------------|---------|
| RESERVOIR | USEABLE : | ** USEABLE STORAGE ** | | | WATERSHED | NO. COURSES AVG'D | THIS YEAR AS % OF | |
| | CAPACITY: | THIS YEAR | LAST YEAR | AVG. | | | LAST YR. | AVERAGE |
| | | | | | Salmon River ab Salmon | 9 | 97 | 63 |
| | | | | | Lemhi River | 12 | 104 | 80 |
| | | | | | Salmon River Total | 31 | 101 | 70 |

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

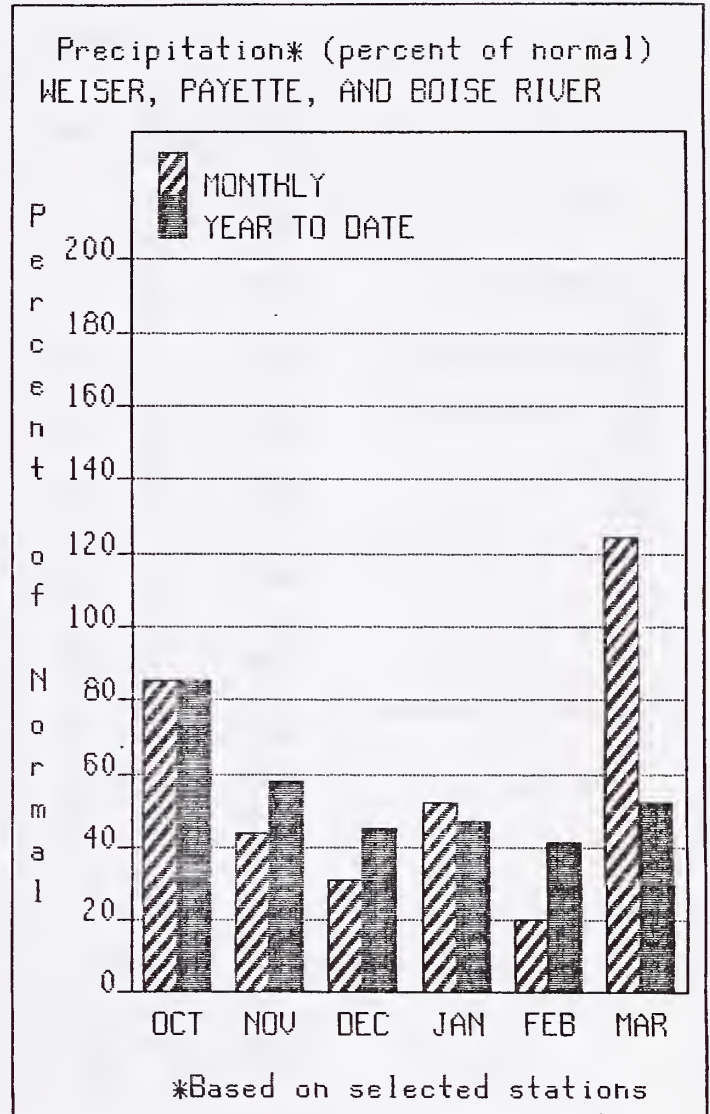
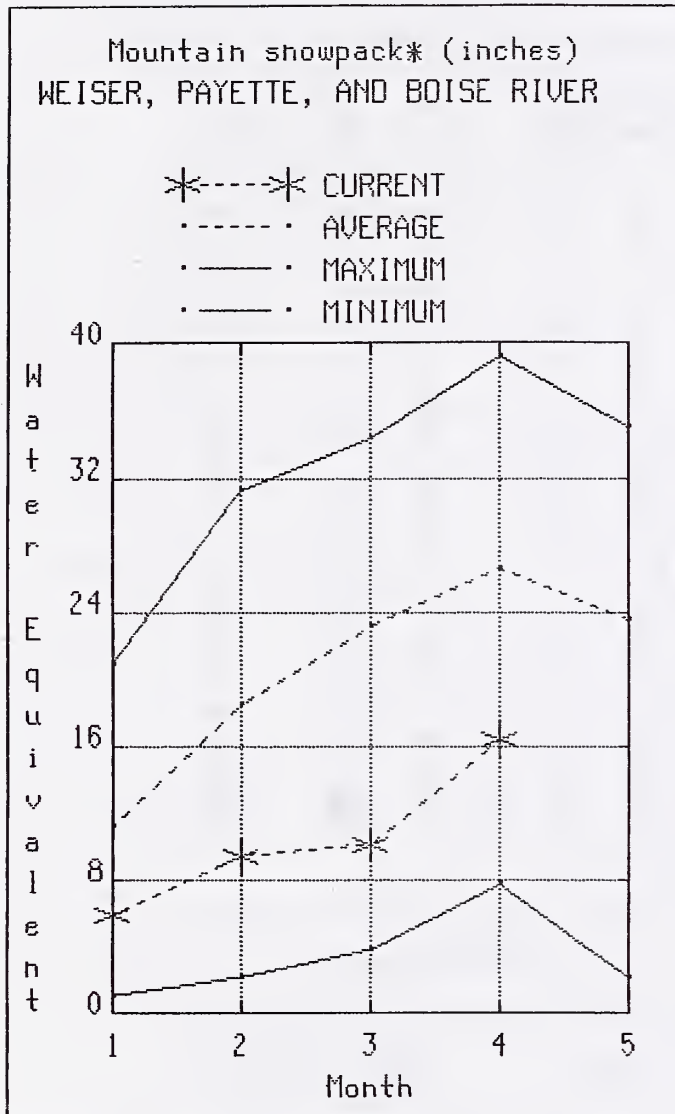
The average is computed for the 1961-1985 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

(2) - The value is natural flow - actual flow may be affected by upstream water management.

Weiser, Payette, and Boise River Basin

April 1, 1991



WATER SUPPLY OUTLOOK

SNOTEL sites in the west central mountains reported over 150% of normal precipitation during the month of March. Snowpacks have improved as a result but are still well below normal. April 1 snow surveys show snowpacks ranging from 50% of average in the Mann Creek basin to 64% in the Middle and North forks of the Boise River. Reservoir storage is above normal in the Payette basin and below normal in the Boise basin. Streamflow forecasts call for well below normal runoff, ranging from 36% for the Weiser near Weiser to 57% for the Boise near Twin Springs. Water users should be prepared for potentially short water supplies, especially in the Weiser and Boise River basins, and should keep in touch with their local irrigation districts for more specific information.

WEISER, PAYETTE, AND BOISE RIVER BASIN

STREAMFLOW FORECASTS

| FORECAST POINT | FORECAST PERIOD | FUTURE CONDITIONS | | | | | | |
|------------------------------------|-----------------|-------------------|-----------------|--|----|-----------------|-----------------|--------------------|
| | | DRIER | | CHANCE OF EXCEEDING | | WETTER | | 25 YR. (1000AF) |
| | | 90% (1000AF) | 70% (1000AF) | 50% (MOST PROBABLE) (1000AF) (Z AVG.) | | 30% (1000AF) | 10% (1000AF) | |
| WEISER nr Weiser (1) | APR-SEP | 31 | 103 | 161 | 36 | 220 | 350 | 444 |
| | APR-JUL | 29 | 95 | 150 | 36 | 205 | 325 | 414 |
| SF PAYETTE at Lowman | APR-SEP | 205 | 235 | 255 | 50 | 275 | 305 | 512 |
| | APR-JUL | 173 | 200 | 220 | 48 | 240 | 265 | 454 |
| DEADWOOD RESERVOIR inflow (1) | APR-JUL | 44 | 62 | 69 | 48 | 76 | 94 | 143 |
| NF PAYETTE at Cascade (1,2) | APR-SEP | 159 | 245 | 280 | 49 | 315 | 395 | 568 |
| | APR-JUL | 149 | 225 | 260 | 49 | 295 | 370 | 531 |
| NF PAYETTE nr Banks (2) | APR-SEP | 200 | 285 | 340 | 46 | 395 | 480 | 737 |
| | APR-JUL | 190 | 265 | 320 | 46 | 375 | 450 | 691 |
| PAYETTE nr Horseshoe Bend (1,2) | APR-SEP | 505 | 765 | 875 | 47 | 985 | 1250 | 1862 |
| | APR-JUL | 465 | 705 | 810 | 47 | 910 | 1150 | 1717 |
| BOISE nr Twin Springs (1) | APR-SEP | 305 | 380 | 415 | 57 | 450 | 525 | 722 |
| | APR-JUL | 270 | 340 | 375 | 56 | 410 | 480 | 664 |
| SF BOISE at Anderson Rnch Dm (1,2) | APR-SEP | 147 | 220 | 255 | 41 | 290 | 365 | 619 |
| | APR-JUL | 132 | 199 | 230 | 40 | 260 | 330 | 578 |
| BOISE nr Boise (1,2) | APR-SEP | 525 | 700 | 780 | 48 | 860 | 1040 | 1628 |
| | APR-JUL | 480 | 645 | 720 | 48 | 795 | 960 | 1508 |
| | APR-JUN | 455 | 585 | 640 | 48 | 700 | 825 | 1334 |

RESERVOIR STORAGE

(1000AF)

WATERSHED SNOWPACK ANALYSIS

| RESERVOIR | USEABLE : | ** USEABLE STORAGE ** | | | WATERSHED | NO. COURSES AVG'0 | THIS YEAR AS % OF | |
|-------------------------|-----------|-----------------------|--------------|-------|---------------------------|-------------------------|-------------------|---------|
| | CAPACITY: | THIS YEAR | LAST YEAR | AVG. | | | LAST YR. | AVERAGE |
| MANN CREEK | 11.3 | 5.8 | 8.8 | 8.7 | Mann Creek | 2 | 93 | 50 |
| CASCADE | 703.2 | 471.5 | 497.5 | 377.6 | Weiser River | 6 | 91 | 57 |
| DEADWOOD | 162.0 | 90.2 | 95.4 | 90.8 | North Fork Payette | 7 | 102 | 62 |
| ANDERSON RANCH | 464.2 | 175.4 | 269.1 | 278.1 | South Fork Payette | 7 | 97 | 59 |
| ARROWROCK | 286.6 | 206.7 | 173.0 | 227.8 | Payette River Total | 14 | 100 | 61 |
| LUCKY PEAK | 307.0 | 95.4 | 137.4 | 153.2 | Middle & North Fork Boise | 7 | 100 | 64 |
| LAKE LOWELL (DEER FLAT) | 177.0 | 114.2 | 115.0 | 152.9 | South Fork Boise River | 9 | 102 | 54 |
| | | | | | Boise River Total | 17 | 104 | 60 |
| | | | | | Canyon Creek | 2 | 0 | 0 |

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

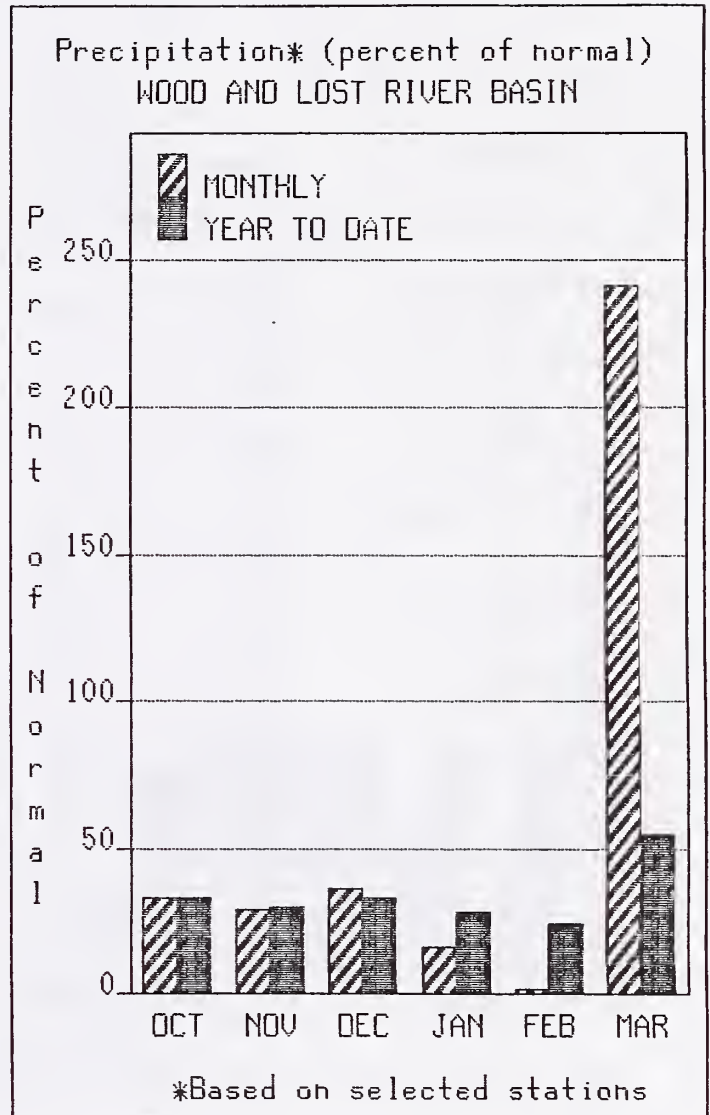
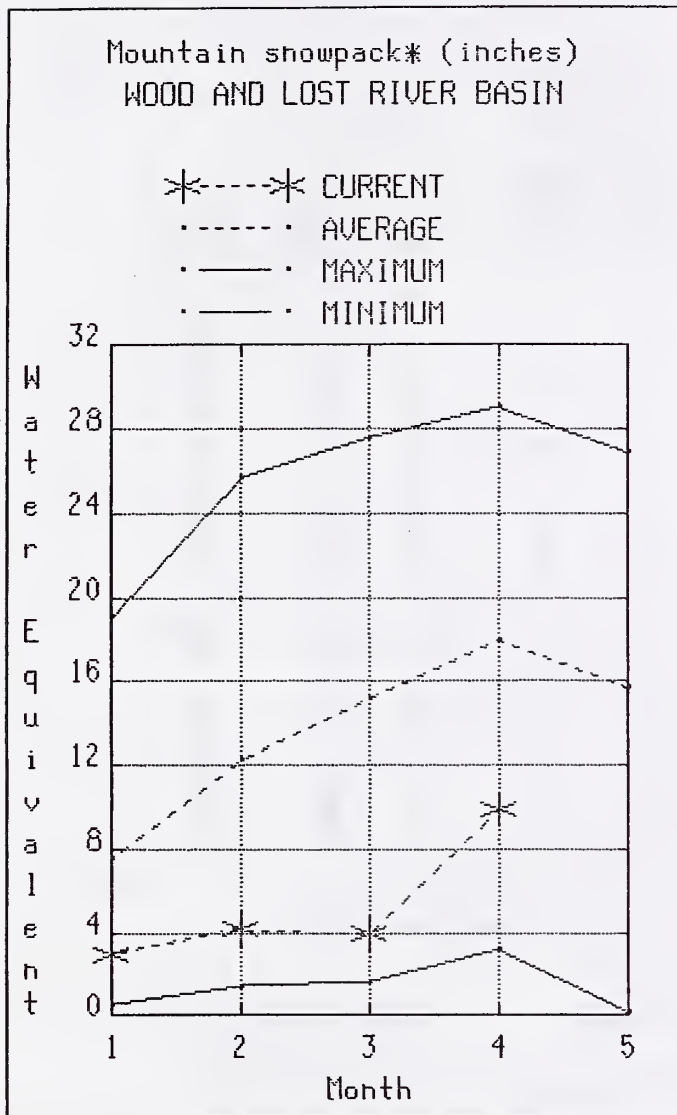
The average is computed for the 1961-1985 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

(2) - The value is natural flow - actual flow may be affected by upstream water management.

Big Wood, Little Wood, Big Lost, and Little Lost River Basin

April 1, 1991



WATER SUPPLY OUTLOOK

Heavy snowfall during the first half of March essentially doubled the snowpack in the east central mountains, but conditions are still well below average. Currently, snowpacks range from 38% of average in the Camas Creek basin to 64% in the Little Lost basin. Streamflow forecasts have improved slightly as a result of the heavy March snowfall but are still well below normal. Reservoir storage is very low in Magic Reservoir, with only 23% of normal storage (14% of capacity). All water users in the Wood and Lost River basins should be prepared for **CRITICALLY SHORT WATER SUPPLIES** this spring and summer and should keep in touch with their local irrigation districts for more specific information.

BIG WOOD, LITTLE WOOD, BIG LOST, AND LITTLE LOST RIVER BASIN

STREAMFLOW FORECASTS

| FORECAST POINT | FORECAST PERIOD | FUTURE CONDITIONS | | | | | | |
|------------------------------------|-----------------|-----------------------|-----------------|--|----|------------------------|-----------------|--------------------|
| | | (<----- DRIER ----->) | | FUTURE CONDITIONS | | (<----- WETTER ----->) | | 25 YR. (1000AF) |
| | | 90% (1000AF) | 70% (1000AF) | 50% (MOST PROBABLE) (1000AF) (% AVG.) | | 30% (1000AF) | 10% (1000AF) | |
| BIG WOOD nr Bellevue | APR-SEP | 23 | 55 | 76 | 36 | 97 | 129 | 214 |
| | APR-JUL | 18.0 | 48 | 68 | 34 | 88 | 118 | 198 |
| BIG WOOD bl Magic Dam (2) | APR-SEP | 20 | 59 | 93 | 28 | 127 | 176 | 338 |
| | APR-JUL | 19.0 | 52 | 85 | 26 | 118 | 166 | 322 |
| LITTLE WOOD nr Carey | APR-SEP | 22 | 34 | 43 | 40 | 52 | 64 | 107 |
| | APR-JUL | 19.0 | 30 | 38 | 38 | 46 | 57 | 99 |
| BIG LOST at Howell Ranch nr Chilly | APR-SEP | 80 | 104 | 120 | 55 | 136 | 160 | 219 |
| | APR-JUL | 69 | 91 | 105 | 55 | 119 | 141 | 192 |
| | APR-JUN | 55 | 70 | 81 | 55 | 92 | 107 | 148 |
| BIG LOST bl Mackay Reservoir (2) | APR-SEP | 58 | 78 | 92 | 47 | 106 | 126 | 195 |
| | APR-JUL | 44 | 63 | 76 | 47 | 89 | 108 | 162 |
| LITTLE LOST bl Wet Ck | APR-SEP | 15.0 | 21 | 25 | 63 | 29 | 35 | 40 |
| | APR-JUL | 12.9 | 17.1 | 20 | 63 | 23 | 27 | 32 |
| LITTLE LOST nr Howe | APR-SEP | 21 | 25 | 28 | 64 | 31 | 35 | 44 |
| | APR-JUL | 16.0 | 19.0 | 21 | 64 | 23 | 26 | 33 |

RESERVOIR STORAGE

(1000AF)

WATERSHED SNOWPACK ANALYSIS

| RESERVOIR | USEABLE : | ** USEABLE STORAGE ** | | | WATERSHED | NO. COURSES AVG'D | THIS YEAR AS % OF | |
|--------------|------------|-----------------------|------|-------|-------------------|-------------------------|-------------------|---------|
| | CAPACITY : | THIS | LAST | AVG. | | | LAST YR. | AVERAGE |
| | | YEAR | YEAR | | | | | |
| MAGIC | 191.5 | 27.5 | 51.7 | 117.4 | Big Wood ab Magic | 10 | 94 | 57 |
| LITTLE WOOD | 30.0 | 14.7 | 22.6 | 18.4 | Canas Creek | 5 | 138 | 38 |
| CAREY VALLEY | NO REPORT | | | | Big Wood Total | 15 | 99 | 53 |
| MACKAY | 44.5 | 26.6 | 27.6 | 33.3 | Little Wood River | 3 | 132 | 58 |
| | | | | | Fish Creek | 3 | 132 | 48 |
| | | | | | Big Lost River | 8 | 109 | 53 |
| | | | | | Little Lost River | 4 | 95 | 64 |

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

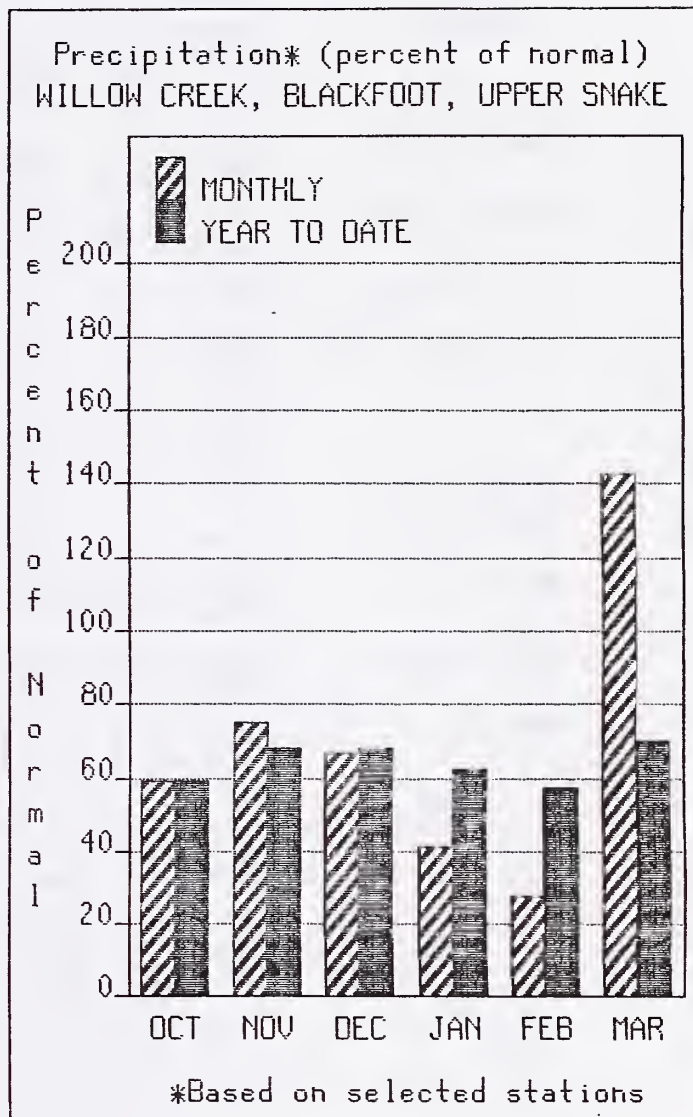
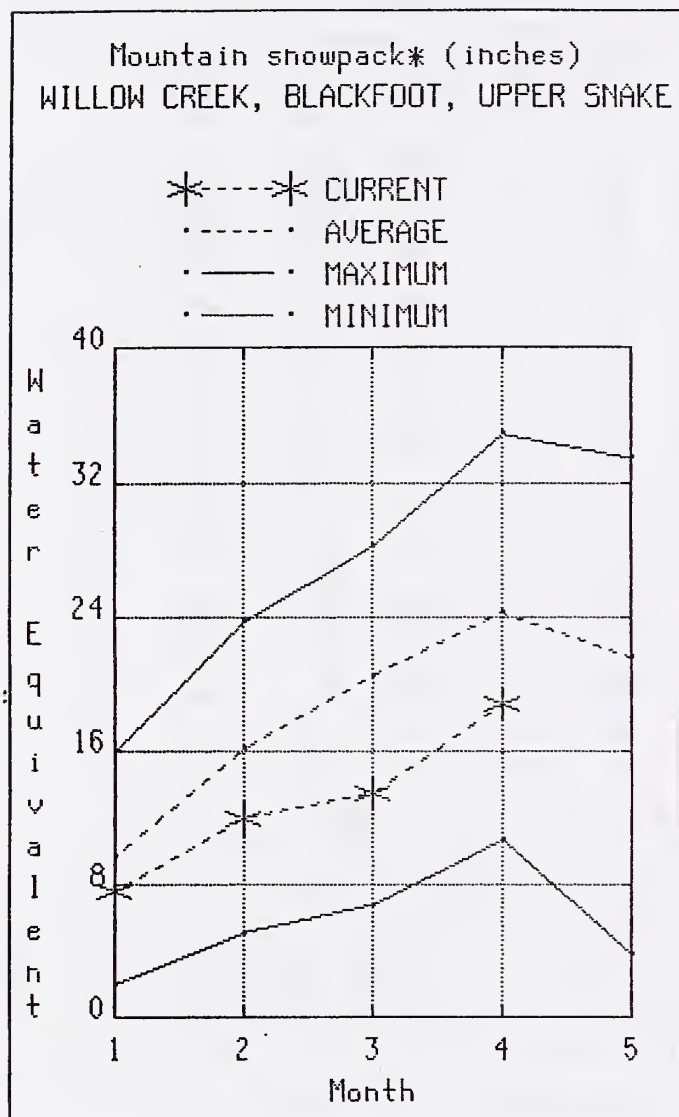
The average is computed for the 1961-1985 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

(2) - The value is natural flow - actual flow may be affected by upstream water management.

Willow Creek, Blackfoot, Upper Snake, and Portneuf River Basin

April 1, 1991



WATER SUPPLY OUTLOOK

Above normal snowfall in eastern Idaho and the upper Snake River basin in western Wyoming has improved the water supply outlook somewhat in these areas. Snowpacks now range from 56% of average in the Camas-Beaver Creek basin to 90% in the Gros Ventre River basin. Streamflow forecasts have improved in response to the abundant March snowfall and now range from 65% of average for the Henry's Fork near Rexburg to 86% for the Snake near Moran. Reservoir storage in nine key reservoirs on the Snake system is near average for this time of year, with 68% of useable capacity. Water supplies should be barely adequate for most users this summer, but water users should keep in touch with their local irrigation districts for more specific information.

WILLOW CREEK, BLACKFOOT, UPPER SNAKE, AND PORTNEUF RIVER BASIN

| STREAMFLOW FORECASTS | | | | | | | | |
|----------------------------------|------------------------|-----------------------|-----------------|---------------------------------|--------------------------|-------------------------|-------------------|--------------------|
| FORECAST POINT | FORECAST PERIOD | FUTURE CONDITIONS | | | | | | 25 YR. (1000AF) |
| | | DRIER | | CHANCE OF EXCEEDING * | | WETTER | | |
| | | 90% (1000AF) | 70% (1000AF) | 50% (MOST PROBABLE) (1000AF) | (% AVG.) | 30% (1000AF) | 10% (1000AF) | |
| HENRYS FORK nr Ashton (2) | APR-SEP | 465 | 505 | 530 | 71 | 555 | 595 | 746 |
| | APR-JUL | 345 | 370 | 390 | 70 | 410 | 435 | 557 |
| HENRYS FORK nr Rexburg (2) | APR-SEP | 765 | 930 | 1030 | 65 | 1130 | 1290 | 1595 |
| | APR-JUL | 600 | 720 | 800 | 63 | 880 | 1000 | 1260 |
| FALLS nr Squirrel (1,2) | APR-JUL | 220 | 260 | 280 | 75 | 300 | 340 | 373 |
| TETON ab S Leigh Ck nr Driggs | APR-SEP | 123 | 138 | 148 | 76 | 158 | 173 | 194 |
| | APR-JUL | 91 | 102 | 110 | 76 | 118 | 129 | 145 |
| TETON nr St. Anthony | APR-SEP | 300 | 330 | 355 | 74 | 380 | 410 | 479 |
| | APR-JUL | 240 | 265 | 285 | 74 | 305 | 330 | 387 |
| SNAKE nr Moran (1,2) | APR-SEP | 610 | 715 | 760 | 86 | 805 | 910 | 888 |
| PALISADES RESERVOIR inflow (1,2) | APR-SEP | 2360 | 2780 | 2970 | 77 | 3160 | 3580 | 3852 |
| SNAKE nr Heise (2) | APR-SEP | 2390 | 2870 | 3190 | 77 | 3510 | 3990 | 4142 |
| | APR-JUL | 2020 | 2420 | 2700 | 77 | 2980 | 3380 | 3524 |
| SNAKE nr Blackfoot (1,2) | APR-SEP | 3070 | 3650 | 4030 | 71 | 4410 | 5000 | 5680 |
| | APR-JUL | 2480 | 2960 | 3260 | 71 | 3560 | 4040 | 4589 |
| PORTNEUF at Topaz | APR-JUL | 37 | 46 | 52 | 69 | 58 | 68 | 75 |
| | APR-SEP | 48 | 60 | 67 | 70 | 75 | 86 | 96 |
| | | | | | | | | |
| RESERVOIR STORAGE (1000AF) | | | | WATERSHED SNOWPACK ANALYSIS | | | | |
| RESERVOIR | USEABLE : CAPACITY: | ** USEABLE STORAGE ** | | | WATERSHED | NO. COURSES AVG'D | THIS YEAR AS % OF | |
| | | THIS YEAR | LAST YEAR | AVG. | | | LAST YR. | AVERAGE |
| ISLAND PARK | 127.6 | 100.4 | 126.2 | 119.3 | Camas-Beaver Creeks | 5 | 100 | 56 |
| GRASSY LAKE | 15.2 | 13.4 | 12.9 | 11.2 | Henrys Fork River | 13 | 103 | 77 |
| JACKSON LAKE | 824.7 | 556.5 | 579.8 | 525.9 | Teton River | 9 | 116 | 79 |
| PALISADES | 1357.0 | 532.3 | 1142.1 | 968.2 | Snake above Palisades | 30 | 105 | 77 |
| AMERICAN FALLS | 1700.0 | 1501.0 | 1527.3 | 1452.5 | Snake above Jackson Lake | 10 | 108 | 82 |
| BROWNLEE | 975.3 | 821.0 | 636.3 | 449.1 | Gros Ventre River | 2 | 104 | 90 |
| BLACKFOOT | 348.7 | 100.8 | 169.7 | 260.7 | Hoback River | 5 | 102 | 76 |
| HENRYS LAKE | 90.4 | 84.0 | 88.1 | 80.1 | Greys River | 5 | 99 | 68 |
| RIRIE | 96.5 | 49.2 | 53.8 | 53.1 | Salt River | 6 | 112 | 74 |
| | | | | | Willow Creek | 8 | 139 | 81 |
| | | | | | Blackfoot River | 9 | 116 | 75 |
| | | | | | Portneuf River | 12 | 123 | 68 |
| | | | | | Toponce Creek | 3 | 130 | 65 |

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

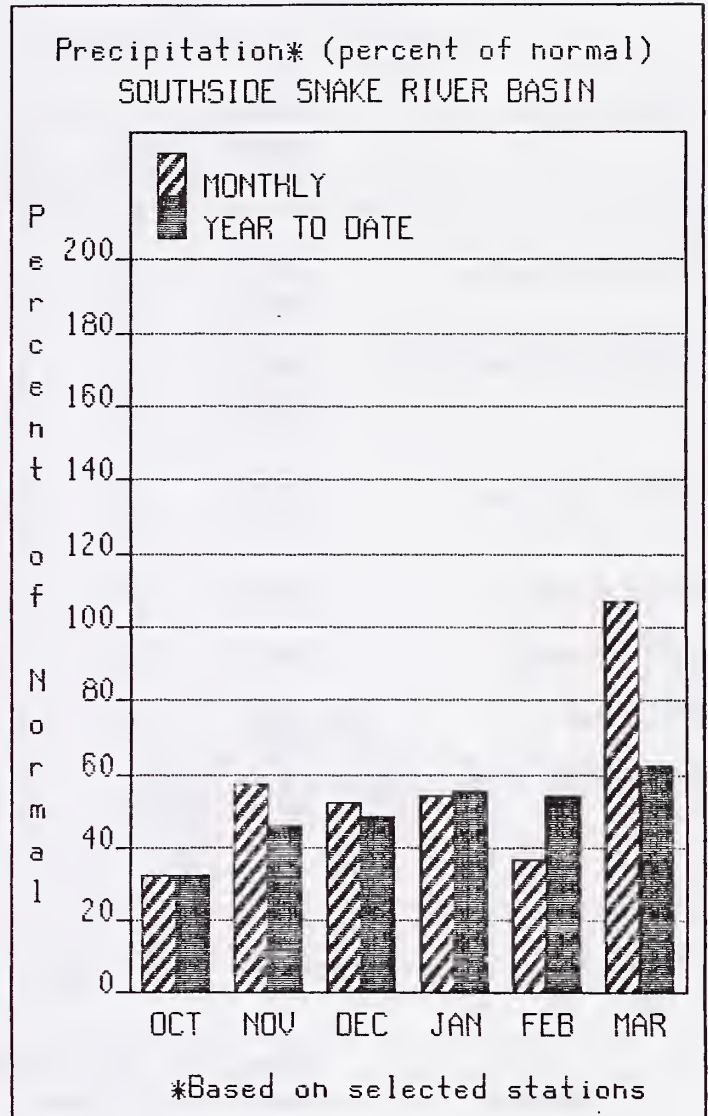
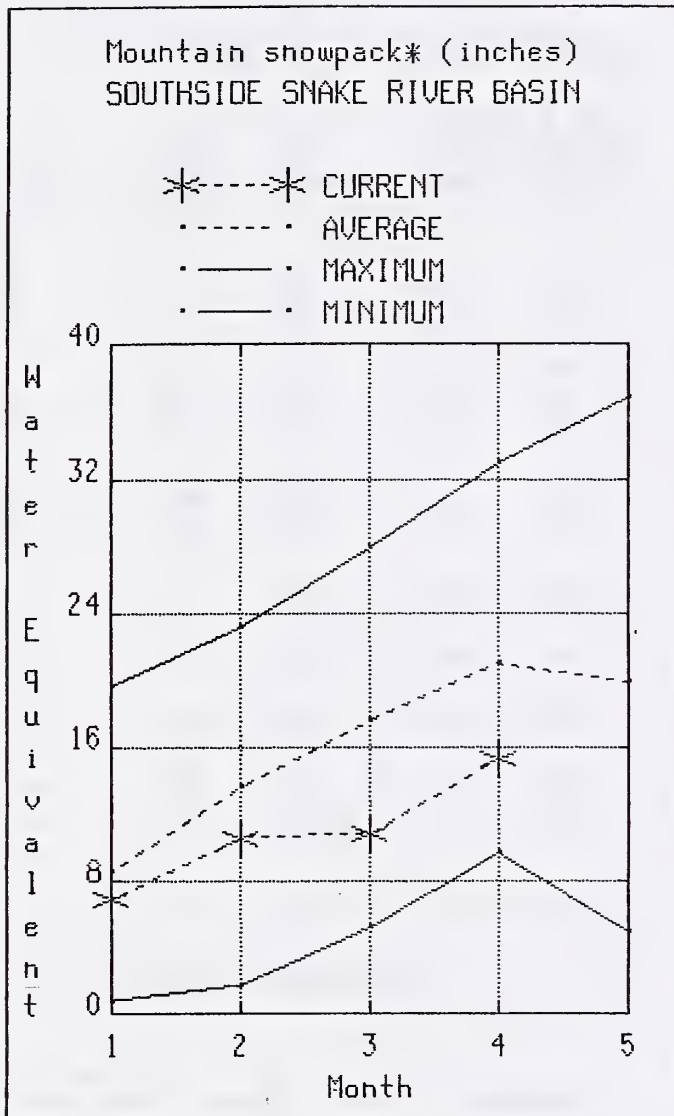
The average is computed for the 1961-1985 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

(2) - The value is natural flow - actual flow may be affected by upstream water management.

Southside Snake River Basin

April 1, 1991



WATER SUPPLY OUTLOOK

Slightly above normal snowfall during March has improved snowpack conditions somewhat along the southern edge of the state. Currently, snowpacks range from 63% of average in the Owyhee and Bruneau basins to 67% in the Raft River. As a result, some streamflow forecasts have improved slightly from those reported last month but still only call for 30 to 57% of normal runoff. Storage is still very low in Oakley, Salmon Falls, and Owyhee reservoirs. Water users could face critically low water supplies this summer and should keep in touch with their local irrigation districts for more specific information.

SOUTHSIDE SNAKE RIVER BASIN

STREAMFLOW FORECASTS

| FORECAST POINT | FORECAST PERIOD | <div style="display: flex; justify-content: space-between; align-items: center;"> <----- DRIER ----- FUTURE CONDITIONS ----- WETTER -----> </div> | | | | | | |
|--------------------------------|-----------------|--|-----------------|---------------------------------|---------|-----------------|-----------------|--------------------|
| | | CHANCE OF EXCEEDING * | | | | | | |
| | | 90% (1000AF) | 70% (1000AF) | 50% (MOST PROBABLE) (1000AF) | % AVG.) | 30% (1000AF) | 10% (1000AF) | 25 YR. (1000AF) |
| OAKLEY RESERVOIR inflow | APR-SEP | 2.3 | 8.1 | 13.0 | 39 | 17.9 | 23 | 33 |
| | APR-JUL | 2.1 | 6.5 | 11.0 | 37 | 15.5 | 21 | 30 |
| SALMON FALLS CK nr San Jacinto | APR-SEP | 5.0 | 21 | 35 | 39 | 49 | 71 | 90 |
| | APR-JUL | 4.0 | 20 | 34 | 40 | 48 | 68 | 86 |
| | APR-JUN | 4.0 | 19.0 | 31 | 39 | 43 | 62 | 80 |
| BRUNEAU nr Hot Spring | APR-SEP | 69 | 108 | 135 | 57 | 162 | 200 | 237 |
| | APR-JUL | 67 | 105 | 130 | 58 | 155 | 193 | 224 |
| OWYHEE nr Gold Ck (2) | APR-JUL | 1.9 | 9.2 | 14.1 | 50 | 19.0 | 26 | 28 |
| OWYHEE nr Owyhee (2) | APR-JUL | 14.0 | 34 | 48 | 56 | 62 | 82 | 86 |
| OWYHEE nr Rome | APR-JUL | 21 | 74 | 124 | 30 | 205 | 320 | 413 |
| OWYHEE RESERVOIR inflow (1,2) | APR-SEP | 18.0 | 99 | 145 | 32 | 210 | 355 | 452 |
| | APR-JUL | 17.0 | 94 | 136 | 32 | 200 | 330 | 425 |

| RESERVOIR STORAGE (1000AF) | | | | | WATERSHED SNOWPACK ANALYSIS | | |
|----------------------------|-------------------------|-----------------------|--------------|-------|-----------------------------|-------------------------|--|
| RESERVOIR | USEABLE : CAPACITY : | ** USEABLE STORAGE ** | | | WATERSHED | NO. COURSES AVG'D | THIS YEAR AS % OF ----- LAST YR. AVERAGE |
| | | THIS YEAR | LAST YEAR | AVG. | | | |
| OAKLEY | 77.4 | 13.3 | 17.5 | 34.0 | Raft River | 8 | 110 67 |
| SALMON FALLS | 182.6 | 22.7 | 36.9 | 62.3 | Goose-Trapper Creeks | 5 | 113 65 |
| OWYHEE | 715.0 | 289.4 | 555.8 | 579.0 | Salmon Falls Creek | 9 | 98 65 |
| | | | | | Bruneau River | 8 | 93 67 |
| | | | | | Owyhee River | 17 | 199 69 |

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

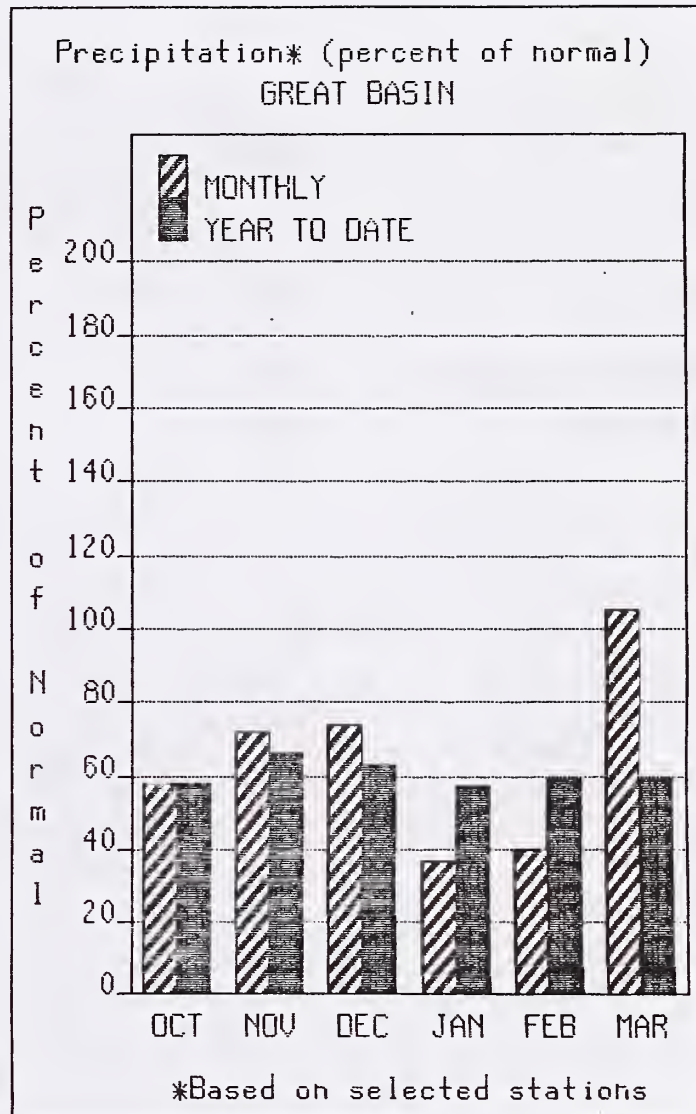
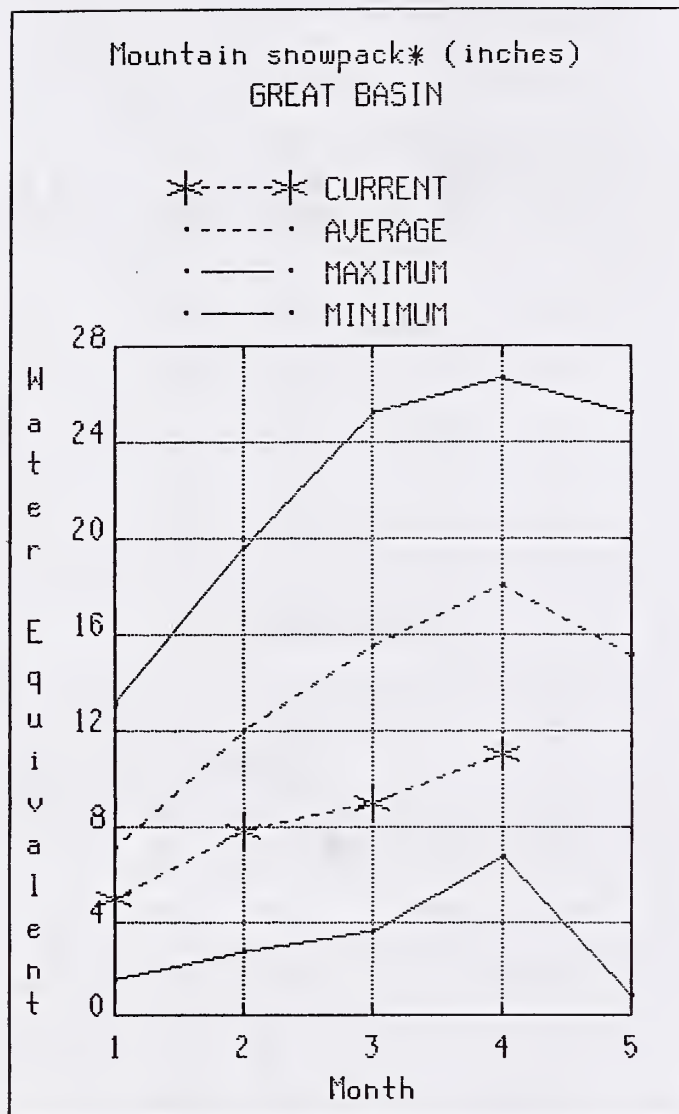
The average is computed for the 1961-1985 base period.

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Great Basin

April 1, 1991



WATER SUPPLY OUTLOOK

The southeast corner of the state received near normal precipitation during March after five successive below normal months. Consequently, most snowpacks have improved slightly from the figures reported last month and range from 61% of average in the Cub River basin to 74% in the Malad River basin. Streamflow forecasts have not improved and still call for well below normal flows. Reservoir storage remains very low in Bear Lake and Montpelier Creek Reservoir, with only 36 and 20% of capacity, respectively. Water users should be prepared for critically short water supplies and should keep in touch with their local irrigation districts for more specific information.

GREAT BASIN

| STREAMFLOW FORECASTS | | | | | | | | |
|-----------------------------|-----------------|-------------------|----------|-----------------------|----------|----------|----------|--------------------|
| FORECAST POINT | FORECAST PERIOD | FUTURE CONDITIONS | | | | | | 25 YR. (1000AF) |
| | | DRIER | | CHANCE OF EXCEEDING * | | WETTER | | |
| | | 90% | 70% | 50% (MOST PROBABLE) | | 30% | 10% | |
| | | (1000AF) | (1000AF) | (1000AF) | (% AVG.) | (1000AF) | (1000AF) | |
| BEAR nr Harer | APR-SEP | 9.0 | 108 | 175 | 56 | 240 | 340 | 310 |
| MONTPELIER CK nr Montpelier | APR-SEP | 1.6 | 5.7 | 8.5 | 61 | 11.3 | 15.4 | 13.9 |
| CUB nr Preston | APR-SEP | | | 31 | 60 | | | 52 |
| | APR-JUL | 15.0 | 23 | 28 | 60 | 34 | 42 | 47 |

| RESERVOIR STORAGE (1000AF) | | | | | WATERSHED SNOWPACK ANALYSIS | | | |
|-------------------------------|-----------------------------|-----------------------|--------------|--------|-----------------------------|-------------------------|-------------------|---------|
| RESERVOIR | USEABLE : CAPACITY: : | ** USEABLE STORAGE ** | | | WATERSHED | NO. COURSES AVG'D | THIS YEAR AS % OF | |
| | | THIS YEAR | LAST YEAR | AVG. | | | LAST YR. | AVERAGE |
| BEAR LAKE | 1421.0 | 518.0 | 746.6 | 1002.1 | Bear River (above Harer) | 12 | 104 | 70 |
| MONTPELIER CREEK | 4.0 | 0.8 | 0.6 | 1.6 | Montpelier Creek | 6 | 124 | 67 |
| | | | | | Mink Creek | 6 | 141 | 70 |
| | | | | | Cub River | 4 | 156 | 61 |
| | | | | | Malad River | 7 | 209 | 57 |
| | | | | | | | | |

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1985 base period.

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(2) - The value is natural flow - actual flow may be affected by upstream water management.

Basin Outlook Reports

and Federal - State - Private Cooperative Snow Surveys

For more water supply and resource management information, contact:

*USDA, Soil Conservation Service
Snow Survey Data Collection Office
3244 Elder Street, Room 124
Boise, Idaho 83705
(208) 334-1614 FTS 554-1614*

How forecasts are made

Most of the annual streamflow in the Western United States originates as snowfall that has accumulated high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are combined with snowpack data to prepare runoff forecasts. Streamflow forecasts are coordinated by Soil Conservation Service and National Weather Service hydrologists. This report presents a comprehensive picture of water supply conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data, and narratives describing current conditions.

Snowpack data are obtained by using a combination of manual and automated SNOTEL measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation and temperature are monitored on a daily basis and transmitted via meteor burst telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

Forecast uncertainty originates from two sources: (1) uncertainty of future hydrologic and climatic conditions, and (2) error in the forecasting procedure. To express the uncertainty in the most probable forecast, four additional forecasts are provided. The actual streamflow can be expected to exceed the most probable forecast 50% of the time. Similarly, the actual streamflow volume can be expected to exceed the 90% forecast volume 90% of the time. The same is true for the 70%, 30%, and 10% forecasts. Generally, the 90% and 70% forecasts reflect drier than normal hydrologic and climatic conditions; the 30% and 10% forecasts reflect wetter than normal conditions. As the forecast season progresses, a greater portion of the future hydrologic and climatic uncertainty will become known and the additional forecasts will move closer to the most probable forecast.

All programs and services of the USDA Soil Conservation Service are offered on a nondiscriminatory basis, without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

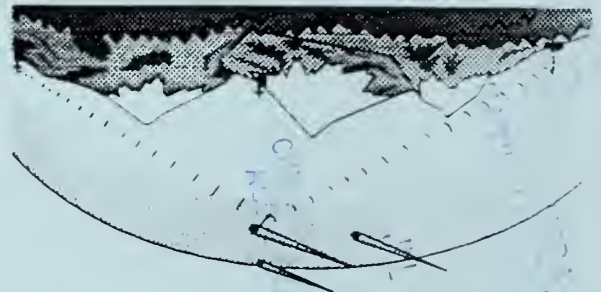
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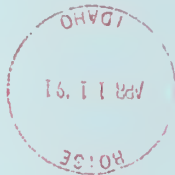
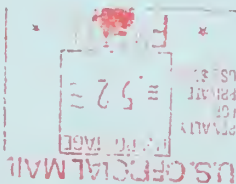
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Department of
Agriculture



Basin Outlook Reports



In addition to basin outlook reports, a Water Supply Forecast for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 248, Portland, OR 97209-3489.

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